

Alchemy and Chemical Symbols

Before modern chemistry, there was alchemy. Arab alchemists in the eighth century AD, in particular Jabir ibn Hayyan, proposed that all metals were formed of mercury and sulphur mixed in various proportions. White metals had very little sulphur, and yellow metals like gold, had more. It seemed like common sense, and was an open invitation for attempts at gold-making.

In 1590s Prague, an unknown alchemist made a flamboyant appearance in a city with a reputation as the alchemical capital of Europe. After courting merchants and bankers, he invited twenty-four of the wealthiest to a banquet, during which he promised to multiply gold. He obtained 100 gold marks from each guest, and placed the coins in a large crucible with a mixture of acids, mercury, lead, salt, eggshells and horse dung. But, as he prepared to operate the bellows of his furnace, there was a tremendous explosion which left the guests spluttering in a fog of fumes. By the time the smoke had cleared, the alchemist had vanished, along with the 2,400 gold marks. Such stories of fraudsters form the modern stereotype of the alchemist, and alchemy is widely seen as little more than the art of changing base metals into gold. Modern chemists are prepared to admit that the alchemists invented many of the chemical processes in use today.

In order to keep their chemical processes secret, alchemists kept notes on their experiments in their own secret code. Symbols were used to represent each of the chemicals. Some of the symbols alchemists used for different elements are known today. The purpose of alchemists symbols was to conceal the nature of their research since their goal was to make gold. But, in 1814 Jöns Berzelius, a Swedish chemist, devised the system of symbols used by scientists. The goal of his symbols was to make it easy to write chemical observations in shorthand that could be easily understood.

Alchemist's Symbols

☉	=	gold
♂	=	iron
♀	=	copper

Devise a system of chemical symbols that is easy to use by answering the questions below.

1. Look up the symbols for the following elements:

- | | | | |
|-------------------|-------|---------------------|-------|
| a. hydrogen | _____ | e. sulfur | _____ |
| b. oxygen | _____ | f. fluorine | _____ |
| c. nitrogen | _____ | g. iodine | _____ |
| d. carbon | _____ | h. phosphorus | _____ |

What rule was used to come up with these symbols? _____

2. Look up the symbols for the following elements:

- | | | | |
|------------------|-------|----------------------|-------|
| a. calcium | _____ | f. chromium | _____ |
| b. cadmium | _____ | g. chlorine | _____ |
| c. cesium | _____ | h. cobalt | _____ |
| d. cerium | _____ | i. californium | _____ |
| e. curium | _____ | j. copper | _____ |

What rule was used to come up with these symbols? _____